CLAIMS

1. Use, as catalyst, of salts of elements of valency μ, with μ at least equal to 3, comprising, as coanions, at least 1 and at most (μ-1) anions carrying a sulfonyl functional group carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene ($-CF_2-$) group.

2. Use according to Claim 1, characterized in that said salt corresponds to the formula:

$$MY_{\mu-q}\xi_q$$

- where M represents a μ-valent and at least trivalent element in the cationic form, preferably known to give Lewis acids;
- where Y is a monovalent anion or a monovalent anionic functional group and
- where ξ^- represents an anion or an anionic functional group carrying a sulfonyl functional group carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene ($-CF_2-$) group and
- where q is an integer advantageously chosen within the closed range (comprising the limits) ranging from 1 to (μ-1) (that is to say, 1 or 2 when μ is 3).

3. Use according to Claims 1 and 1, characterized in that said: ξ^- corresponds to the formula:

$R_1—Z-SO_2—R_x$

- where Z represents an atom from the nitrogen column or a chalcogen;
- where, when Z represents an atom from the nitrogen column, R_1 represents an electron-withdrawing radical;
- where R_x is a radical in which the atom, generally a carbon atom, carrying the sulfonyl functional group is perhalogenated, advantageously R_x is R_f of formula:

$$EWG-(CX_2)_p-$$

in which:

- the X groups, which are alike or different, represent a fluorine or a radical of formula C_nF_{2n+1}, with n an integer at most equal to 5, preferably to 2;
- p represents zero or an integer at most equal to 2, with the proviso that, when p represents zero, EWG is chlorine and especially fluorine;
- EWG represents a hydrocarbonaceous group, advantageously an electron-withdrawing group (that is to say, the Hammett constant σ_p of which is greater than 0, advantageously than 0.1, preferably than 0.2), the possible functional groups of which are inert under the reaction conditions, preferably fluorine or a perfluorinated residue of formula C_nF_{2n+1}, with n an integer at most equal to 8, advantageously to 5.

4. Use according to Claims 1 to 3 of salts of elements of valency μ, with μ at least equal to 3, comprising, as coanions, at least 1 and at most (μ-1) sulfonate anions in which the sulfonic functional group is carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene ($-CF_2-$) group.

5. Use according to Claim 4, characterized in that said use is the use as catalyst of Lewis acid type.

6. Use according to Claims 1 to 5, characterized in that said salt corresponds to the formula:

$$MY_{3-q}[(R_X)-SO_2-O^-]_q$$

with M represents an at least trivalent element in the cationic form, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional group and where R_x is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is an integer advantageously chosen between 1 and 2 (that is to say, 1 or 2).

7. Use according to Claims 1 to 6, characterized in that said salt is a salt of formula:

$$MY_{\mu-q}(R_xSO_2-O^-)_q,$$

- where M is an element in an at least trivalent cationic form;
- where μ represents the charge of the cation corresponding to M;

- where Y represents the anion or anions, other than the sulfonates perhalogenated on the carbon carrying said sulfonate functional group;
- where q represents an integer chosen within the closed range from 1 to μ-1.

8. Use according to Claims 1 to 7, characterized in that said element is chosen from rare earth metals (scandium, yttrium, lanthanum and lanthanide) and elements forming a square in the Periodic Table composed of gallium, germanium, arsenic, indium, tin, antimony, thallium, lead and bismuth.

9. Use according to Claims 1 to 8, characterized in that said salt is a trivalent metal salt comprising, as coanions, at least 1 and at most 2 sulfonate anions in which the sulfonic functional group is carried by a perhalogenated atom, preferably a perfluorinated atom, more preferably a perfluoromethylene ($-CF_2-$) group.

10. Use according to Claims 1 to 9, characterized in that said salt corresponds to the formula:

$$MY_{3-q}[(R_x)-SO_2-O^-]_q$$

with M representing a trivalent metal, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional group and where R_x is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is an

integer advantageously chosen between 1 and 2 (that is to say, 1 or 2).

11. Catalytic composition, characterized in that it comprises one or more compounds corresponding to the empirical formula:

$$MY_{3-q}[(R_x)-SO_2-O^-]_q$$

with M representing an at least trivalent element, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional group and where R_x is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is between 0.1 and 2.9, advantageously from 0.5 to 2.5, preferably from 1 to 2, inclusive.

12. Catalytic composition according to Claim 11, characterized in that it is obtained, advantageously in situ, by introduction of at least one acid ξH onto a salt MY_μ where M is advantageously chosen from [lacuna] earth metals, gallium, germanium, arsenic, indium, tin, antimony, thallium and lead.

13. Compound of formula:

$$MY_{\mu-q}(R_xSO_2-O^-)_q,$$

- where M is an element in an at least trivalent cationic form;
- where μ represents the charge of the cation corresponding to M;

- where Y represents the anion or anions, other than the sulfonates perhalogenated on the carbon carrying said sulfonate functional group;
- where q represents an integer chosen within the closed range from 1 to μ-1.

14. Compound according to Claim 13 of formula:

$$MY_{3-q}[(R_x)-SO_2-O^-]_q$$

with M representing a trivalent metal, preferably known for giving Lewis acids, where Y is a monovalent anion or a monovalent anionic functional group and where R_x is a radical in which the carbon carrying the sulfonic functional group is perhalogenated and where q is an integer chosen between 1 and 2 (that is to say, 1 or 2).

15. Reactant comprising:

- a catalytic composition according to Claim 11;
- an agent capable of giving carbocations in the presence of Lewis acid chosen from acid anhydrides, in particular carboxylic and sulfonic anhydrides, carbonyls, in particular aldehydes, or conjugated dienes.

16. Reactant comprising:

- a catalytic composition according to Claim 11;
- an oxygen-comprising heterocycle, chosen in particular from cyclic ethers and lactones.